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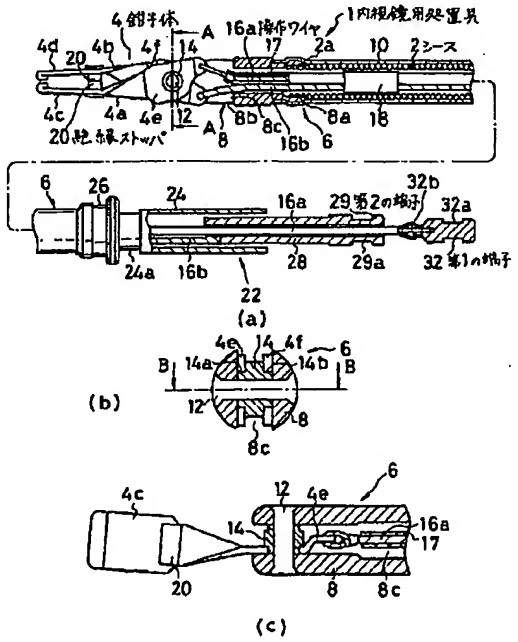
(54)【考案の名称】　内視鏡用高周波処置具

(57)【要約】

【目的】接触不良による熱傷等を防止し、効率よく処理を行なうとともに、患部の把持を確実に行なえる内視鏡用高周波処置具の提供を目的としている。

【構成】内視鏡の処置具挿通用チャンネルに挿通されるべき電気絶縁性を有する可撓管２と、この可撓管２の先端に、互いに電気絶縁されて開閉自在に枢着された一対の処理用電極４ａ，４ｂと、各電極４ａ，４ｂにそれぞれ接続されてこれら電極の開閉操作を行なうとともに、前記可撓管２内において互いに電気絶縁されて延在し、一部で互いに固定された複数の導電用および作動用のケーブル１６ａ，１６ｂと、各ケーブル１６ａ，１６ｂの末端を個々に高周波電源に導通させる接続手段を含む操作部３０とからなり、前記処理用電極４ａ，４ｂに、その内側に突出し、電極４ａ，４ｂの閉状態時に各電極４ａ，４ｂの先端が接触するのを防止する少なくとも１つの絶縁ストッパ２０を設けたものである。



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【実用新案登録請求の範囲】

【請求項１】　内視鏡の処置具挿通用チャンネルに挿通されるべき電気絶縁性を有する可撓管と、この可撓管の先端に、互いに電気絶縁されて開閉自在に枢着された一対の処理用電極と、各電極にそれぞれ接続されてこれら電極の開閉操作を行なうとともに、前記可撓管内において互いに電気絶縁されて延在し、一部で互いに固定された複数の導電用および作動用のケーブルと、各ケーブルの末端を個々に高周波電源に導通させる接続手段を含む操作部とからなり、前記処理用電極は、その内側に突出し、電極の開状態時に各電極の先端が接触するのを防止する少なくとも１つの絶縁ストッパを有することを特徴とする内視鏡用高周波処置具。

【図面の簡単な説明】

【図１】（ａ）は本考案の第１の実施例を示す内視鏡用高周波処置具の挿入部および接続部における側断面図、（ｂ）は（ａ）のＡ－Ａ線に沿う縦断面図、（ｃ）は（ｂ）のＢ－Ｂ線に沿う断面図である。

【図２】本考案の第１の実施例を示す内視鏡用高周波処置具の操作部の概略構成図である。

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＊【図３】図２の操作部に図１の接続部を接続した詳細断面図である。

【図４】（ａ）は図３のＣ－Ｃ線に沿う断面図、（ｂ）は図３のＤ－Ｄ線に沿う断面図である。

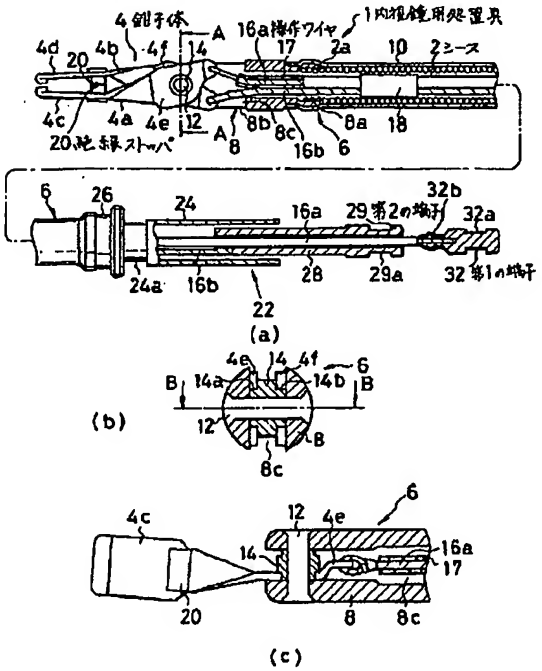
【図５】図１の内視鏡用高周波処置具の絶縁ストッパの変形例を示す断面図である。

【図６】図１の内視鏡用高周波処置具の絶縁ストッパの変形例を示す断面図である。

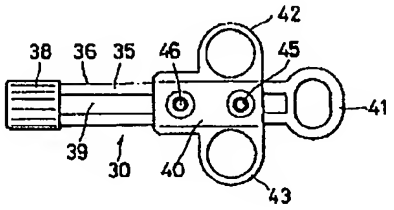
【符号の説明】

１…内視鏡用高周波処置具
２…シース
４…鉗子体
１２…回動ピン
１６…操作ワイヤ
１８…収束部材
２０，７０，７５…絶縁ストッパ
２９，３２…第２の端子
３０…操作部
４５，４６…取付部

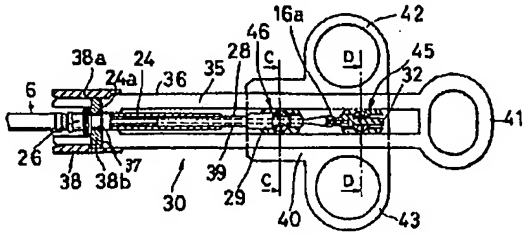
【図１】



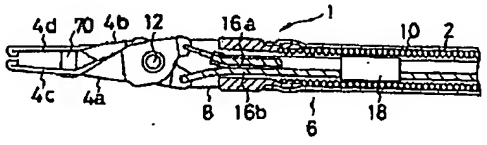
【図２】



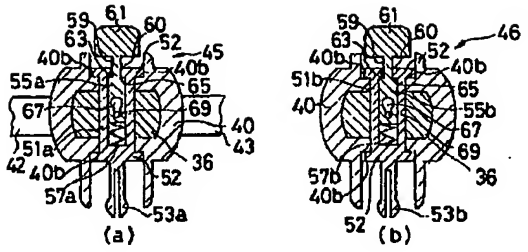
【図３】



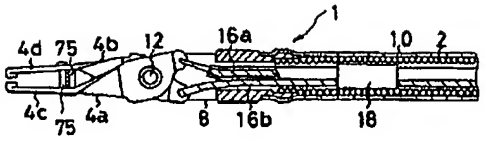
【図５】



【図４】



【図６】



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【考案の詳細な説明】

【0001】

【産業上の利用分野】

本考案は、経内視鏡的に体腔内へ導入し、体腔内組織の切開、切除あるいは凝固等の処理を行なう内視鏡用高周波処置具に関する。

【0002】

【従来の技術】

従来、経内視鏡的に使用される高周波処置具としては、特開昭58－152914号公報に示すように、一方の処理側電極のみを体腔内へ導入し、他方の電極（対極板）は患部の体皮に広く接触させ、体腔内に導入された前記処理側電極の患部との接触部に高周波電流を集中させて、その接触部の組織の切開、切除あるいは凝固等の処置を行なうものが知られている。

【0003】

また、実公昭53－34232号公報やUSP第4005714号明細書に示されているように、患部組織と接触しない部位に絶縁材を被覆することによって相互に絶縁され、かつ弾性拡開性を付与された2極の処理用電極をシース先端から突没させることによってこれら2極の処理用電極を開閉させ、これによって患部を把持して前記種々の処置を行なう高周波処置具が提案されている。

【0004】

また、これとは逆にドイツ特許公開公報DE2734847号明細書に示されるものは、シースが、弾性拡開性を付与されて前記シース内に収容された2極の処理用電極に対して移動することによって前記2極の処理用電極をシース先端から突没させて開閉させ、これによって患部を把持して前記各公報のものと同様の処置を行なおうとするものである。

【0005】

【考案が解決しようとする課題】

しかし、特開昭58－152914号公報のものは、一方の処理側電極のみを体腔内へ導入し、他方の電極（対極板）は患部の体皮に接触させて処置を行なうため、効率及び処理能力の点で不都合であったり、また、対極板の接触不良によ

り、体皮に熱傷を生じる虞があった。

【０００６】

これに対し、実公昭５３－３４２３２号公報やＵＳＰ４００５７１４のものは、患部の体皮に配置される対極板がないため、接触不良による体皮の熱傷は回避され得るものの、弾性拡開性を付与された２極の処理用電極がシースから進退移動するため、患部を確実に把持することができない場合があった。また、各電極の絶縁被覆部分が摺動するため、この被覆部位が弛み、作動不良を生じる虞があった。

【０００７】

一方、ドイツ特許公開公報ＤＥ２７３４８４７号明細書に記載されたものは、シースが移動するため電極がしなり易く、そのため患部を確実に把持することができなかった。

【０００８】

本考案は上記事情に着目してなされたものであり、その目的とするところは、接触不良による熱傷等を防止し、効率よく処理を行なうとともに、患部の把持を確実に行なえる内視鏡用高周波処置具を提供することにある。

【０００９】

【課題を解決するための手段】

上記課題を解決するために、本考案の内視鏡用高周波処置具は、内視鏡の処置具挿通用チャンネルに挿通されるべき電気絶縁性を有する可撓管と、この可撓管の先端に、互いに電気絶縁されて開閉自在に枢着された一対の処理用電極と、各電極にそれぞれ接続されてこれら電極の開閉操作を行なうとともに、前記可撓管内において互いに電気絶縁されて延在し、一部で互いに固定された複数の導電用および作動用のケーブルと、各ケーブルの末端を個々に高周波電源に導通させる接続手段を含む操作部とからなり、前記処理用電極に、その内側に突出し、電極の閉状態時に各電極の先端が接触するのを防止する少なくとも１つの絶縁ストッパを設けたものである。

【００１０】

【作用】

各処理用電極に接続された導電性の作動ケーブルの末端を個々に高周波電源に導通させる接続手段によって、前記処理用電極に高周波電流を供給するため、両電極間には高周波電流が局部的に流れる。また、処理用電極は可撓管の先端に、開閉自在に互いに枢着されるとともに、作動ケーブルは一部で互いに固定されているので、処理用電極の開閉操作を行なう際、その操作力は各作動ケーブルに均等に伝わることができるとともに、処理用電極の開閉動作を確実に行なって患部組織を確実に把持することができる。また、把持力の規制は絶縁ストッパによって行なわれる。

【００１１】

【実施例】

以下、図面を参照しつつ本考案の実施例を説明する。図１および図２は本考案の第１の実施例を示したものである。図１の（ａ）は本実施例の内視鏡用高周波処置具１の要部構成を示すもので、２は内視鏡の処置具挿通用チャンネルに挿通され、可撓性を有する金属性のコイルシースであり、後述する鉗子体４とともに内視鏡用高周波処置具１の挿入部６を構成している。このシース２の先端には略管状の絶縁性を有する先端カバー部材８が固定されている。シース２の先端部外周面には、先端カバー部材８の基端部側に形成された固定部８ａが嵌着する固定用溝部２ａが形成されている。

【００１２】

先端カバー部材８の先端部側には、固定部８ａよりも大径な大径部８ｂが形成されている。この先端カバー部材８の大径部８ｂにはスリット部８ｃが形成されている。そして、先端カバー部材８の固定部８ａからコイルシース２の外周にかけて絶縁性チューブ１０が被覆されている。

【００１３】

さらに、先端カバー部材８のスリット部８ｃの開口端側には、処理用電極としての一対の鉗子体４ａ，４ｂが回動ピン１２を中心に回動自在に連結されて先端が開閉可能になっている。これらの鉗子体４ａ，４ｂには先端部側に体腔内の異物等を把持する把持部４ｃ，４ｄ、基端部側に回動ピン１２に固定される固定部４ｅ，４ｆがそれぞれ形成されている。

なお、各鉗子体４ａ，４ｂは、例えば金属板等の板材の一部をねじって把持部４ｃ，４ｄと固定部４ｅ，４ｆとを形成したものである。

【００１４】

さらに、先端カバー部材８のスリット部８ｃ内には図１の（ｂ）に示すように回動ピン１２の周囲に電気絶縁性の間隔部材１４が装着されている。さらに、この間隔部材１４の両端部には鉗子体連結溝１４ａ，１４ｂが形成されている。そして、この間隔部材１４の鉗子体連結溝１４ａ，１４ｂと先端カバー部材８におけるスリット部８ｃの内壁面との間で各鉗子体４ａ，４ｂの固定部４ｅ，４ｆが回動自在に枢支されるとともに、各鉗子体４ａ，４ｂは相互に絶縁されている。また、鉗子体４ａ，４ｂの把持部４ｃ，４ｄにはそれぞれ、その内側に突出して、把持部４ｃ，４ｄの閉状態時に相互に接触して把持部４ｃ，４ｄの先端の接触を防止する絶縁ストッパ２０，２０が設けられている。

【００１５】

また、シース２内には作動ケーブルとしての２本の操作ワイヤ１６ａ，１６ｂが挿通され、それぞれ鉗子体４ａ，４ｂの固定部４ｅ，４ｆに、図１の（ｃ）に示すように輪を形成して接続されている。なお、操作ワイヤの一方１６ａは、絶縁性のチューブ１７で被覆され、先端部側で他方１６ｂと集束部材１８によって結束されている。

【００１６】

挿入部６は、その手元側に接続される接続部２２によって図２に示す操作部３０に接続される。この場合、挿入部６のシース２の基端部が接続部２２の接続部材２４先端に設けられたシース接続部２６に接続される。

【００１７】

接続部材２４のシース接続部２６の後方外周部には第３のくびれ溝２４ａが形成されている。また、絶縁チューブ１７が被覆されていない操作ワイヤ１６ｂが管状部材２８に機械的かつ電気的に接続している。この管状部材２８は、その先端側の一部が接続部材２４内に略同軸に配設されており、基端側は接続部材２４の基端より突出している。また、絶縁チューブ１７が被覆された操作ワイヤ１６ａは、管状部材２８内を通って延び、管状部材２８の基端より突出して、第１の

端子３２の先端側に形成された固定部３２ｂに機械的かつ電気的に結合している。第１の端子３２の基端側外周には第１のくびれ溝３２ａが形成されている。また、管状部材２８の基端側は第２の端子２９となっており、この第２の端子２９の外周にも第２のくびれ溝２９ａが形成されている。

【００１８】

操作部３０は、レール３５を有する本体３６と、この本体３６の先端に設けられたシース固定部３８と、本体３６の軸方向に沿って摺動自在に設けられたスライダ４０とからなる。

【００１９】

シース固定部３８には接続部材２４のシース接続部２６が着脱自在に接続できるようになっている。すなわち、図３に示すように、シース固定部３８は回転環３８ａと固定板３８ｂとからなり、回転環３８ａ内には偏心した穴が設けられている。そして、この穴内に固定板３８ｂが組み込まれていて、回転環３８ａを一定の方向に回転させることによって必然的に前記偏心穴も回転し、これによって偏心穴内に組み込まれた固定板３８ｂが上方向にスライドして、固定板３８ｂに設けられた小孔３７内に接続部材２４の第３のくびれ溝２４ａが係合するようになっているものである。また、この係合を解除するには回転環３８ａを前記方向と逆方向に回転させればよい。

【００２０】

操作部３０の本体３６は、中央にスリット３９を有し、末端に親指かけ部４１を有する。また、スライダ４０は２つの指かけ４２，４３を有するとともに、軸方向に間隔をおいて２つの取付部、すなわち、第１の取付部４５と第２の取付部４６を有する。第１および第２の取付部４５，４６は各操作ワイヤ１６ａ，１６ｂの末端を個々に高周波電源に導通させる接続手段を構成している。

【００２１】

第１および第２の取付部４５，４６はそれぞれ、図４の（ａ），（ｂ）に示すように、スライダ４０に固定されスリット３９内を摺動可能な略筒状の第１の収容部材５１ａと第２の収容部材５１ｂを有している。

【００２２】

第１の収容部材５１ａと第２の収容部材５１ｂは両端部に形成されたフランジ部５２をスライダ４０の外周面に形成された溝部４０ｂに係止することによってスライダ４０に固定されるとともにスリット３９内に保持される。

【００２３】

第１および第２の収容部材５１ａ，５１ｂの一方の端部には、高周波電源との電気的接続をなす第１および第２のプラグ５３ａ，５３ｂがフランジ部５２より延出して形成されている。第１および第２の収容部材５１ａ，５１ｂ内には、第１および第２の押し棒５５ａ，５５ｂと、これら押し棒５５ａ，５５ｂを収容部材５１ａ，５１ｂの軸方向に付勢する第１および第２のばね５７ａ，５７ｂが収容されている。第１および第２の押し棒５５ａ，５５ｂは、ばね５７ａ，５７ｂによって付勢される側と反対側の端部が細く形成されたくびれ部５９となっており、このくびれ部５９は、第１および第２の収容部５１ａ，５１ｂの他方の端部に設けられた開口部６０から外部に突出しており、この突出した端部は大径なボタン部６１に形成されている。そして、押し棒５５ａ，５５ｂは、通常の状態においては、ばね５７ａ，５７ｂの付勢力によって、くびれ部５９を形成する段差部６３が収容部材５１ａ，５１ｂの内周面端部に形成された段差部６５に突当たった状態で収容部材５１ａ，５１ｂ内に保持されている。

また、第１および第２の押し棒５５ａ，５５ｂにはそれぞれ、通孔６７と、この通孔６７に達する溝６９がそれぞれ形成されている。

【００２４】

挿入部６を操作部３０に接続する際には、まず、接続部２２の基端側部分を操作部３０の本体３６のスリット３９内に通す。そして、第１および第２の取付部４５，４６のボタン部６１を押し込むことによって第１および第２の押し棒５５ａ，５５ｂを第１および第２のばね５７ａ，５７ｂの付勢力に抗して押し込み、第１および第２の押し棒５５ａ，５５ｂの通孔６７内に接続部２２の第１の端子３２と第２の端子２９を挿入する。そして、第１の端子３２の第１のくびれ溝３２ａと第２の端子２９の第２のくびれ溝２９ａを第１および第２の押し棒５５ａ，５５ｂの溝６９付近に位置させた後、ボタン部６１を離す。これによって、第１および第２の押し棒５５ａ，５５ｂが第１および第２のばね５７ａ，５７ｂの

付勢力によって押し上げられ、第１および第２の押し棒５５ａ，５５ｂの溝６９に第１の端子３２の第１のくびれ溝３２ａと第２の端子２９の第２のくびれ溝２９ａが嵌合し、操作ワイヤ１６ａ，１６ｂがスライダ４０に固定される。

【００２５】

さらに、操作部３０のシース固定部３８内に接続部材２４のシース接続部２６付近を位置させるとともに、シース固定部３８の回転環３８ａを回転させて固定板３８ｂをスライドさせ、固定板３８ｂを接続部材２４の第３のくびれ溝２４ａに係合させる。これによって、シース２が接続部２２に接続されるとともに、操作部３０と連結されるものである。

【００２６】

次に、上記構成の内視鏡用高周波処置具１の動作について説明する。まず、内視鏡用高周波処置具１の使用時には内視鏡の挿通チャンネルを介してこの内視鏡用高周波処置具１が体腔内に導入される。そして、内視鏡による観察下で内視鏡用高周波処置具１の先端部を回収しようとする異物に近づけた後、内視鏡用高周波処置具１を操作する。

【００２７】

この内視鏡用高周波処置具１の操作時には操作部のスライダ４０を操作する。この場合、例えば操作部３０のスライダ４０を先端部側に向けて押し出し操作することにより、操作ワイヤ１６ａ，１６ｂを一緒に押し進めて先端の鉗子体４ａ，４ｂの把持部４ｃ，４ｄを開き、この開いた鉗子体４ａ，４ｂを体腔内組織、例えば出血部位に誘導する。

【００２８】

この状態で、続いて操作部３０のスライダ４０を手元側に引き操作して操作ワイヤ１６ａ，１６ｂを手元側に引っ張り操作することにより、先端の鉗子体４ａ，４ｂの把持部４ｃ，４ｄを閉じ、異物を把持する。この時、各把持部４ｃ，４ｄに設けられた対向するストッパ２０，２０同志の当接によって把持部４ｃ，４ｄの先端は接触しない。

【００２９】

そして、図示しない高周波電源と、操作部３０のスライダ４０内の第１の取付

部４５および第２の取付部４６に設けられた収容部材５１ａ，５１ｂのプラグ５３ａ，５３ｂとを電気的に接続して、第１の取付部４５および第２の取付部４６を介して各操作ワイヤ１６ａ，１６ｂに個々に高周波電流を流して鉗子体４ａ，４ｂに通電すると、両把持部４ｃ，４ｄ間に高周波電流が流れるので、把持した組織が焼灼凝固できる。

【００３０】

したがって、上記構成の内視鏡用高周波処置具１は、操作部３０のスライダ４０に設けられた２つの取付部４５，４６を介して各操作ワイヤ１６ａ，１６ｂの末端を個々に高周波電源に導通させる接続手段を構成するとともに、これによって、処理用電極としての鉗子体４ａ，４ｂに個々に高周波電流を供給するものであるため、局部的な処理能力を高めることができる。

また、体極板を使用していないため、接触不良等によって体皮を熱傷させることがない。

【００３１】

さらに、鉗子体４ａ，４ｂは先端カバー８に枢着され、回動ピン１２を軸心として施回して開閉するとともに、操作ワイヤ１６ａ，１６ｂは互いに集束部材１８によって結束され、１つのスライダ４０に確実に固定されているので、鉗子体４ａ，４ｂの開閉動作を行なう際、操作ワイヤ１６ａ，１６ｂに均等に力を伝えることができ、把持部４ｃ，４ｄの開閉動作を確実に行なって患部組織を確実に把持することができる。

【００３２】

また、その一方で、鉗子体４ａ，４ｂの把持部４ｃ，４ｄには、その内側に突出する絶縁ストッパ２０，２０が設けられ、把持部４ｃ，４ｄの閉状態時に相互に接触して把持部４ｃ，４ｄの先端が接触することを防止しているため、患部組織を把持しすぎて、これを機械的に切断してしまうことがない。

なお、各操作ワイヤ１６ａ，１６ｂの末端を個々に高周波電源に導通させる接続手段は、上記構成のものに限られるものではない。

【００３３】

また、鉗子体４ａ，４ｂの把持部４ｃ，４ｄの閉状態時に把持部４ｃ，４ｄの

先端が接触することを防止する絶縁ストッパは、図5に示すように、把持部の一方4aにのみ設けられて、把持部4c，4dの閉状態時に、把持部の他方4bの内面と接触するようなもの70であってもよい。あるいは、図6に示すように、各把持部4c，4dの内面に設けられて、互いに当接することなく、相対する把持部4c，4dの内面にそれぞれ接触するようなもの75，75であってもよい。

【0034】

【考案の効果】

以上説明したように、本考案は、各処理用電極に接続された導電性の作動ケーブルの末端を個々に高周波電源に導通させる接続手段によって、前記処理用電極に高周波電流を供給し、両電極間に高周波電流を局部的に流すため、その処理能力を高めることができる。

また、体極板を使用していないため、その接触不良等によって体皮を熱傷させることがない。

【0035】

さらに、処理用電極は可撓管の先端に、開閉自在に互いに枢着されるとともに、各作動ケーブルは一部でまとめて固定されているので、処理用電極の開閉操作を行なう際、各作動ケーブルに均等に操作力を伝えることができ、処理用電極の開閉動作を確実に行なって患部組織を確実に把持することができる。また、その一方で、処理用電極は、その内側に突出し、電極の閉状態時に各電極の先端が接触するのを防止する絶縁ストッパを有しているため、患部組織を把持しすぎて、これを機械的に切断してしまうことがない。

A translation of the full text of Japanese Utility Model Unexamined Publication No.5-5106

Japanese Utility Model Laid-Open No. 05-5106

Publication Date: January 26, 1993

Application No. 03-51766

Application Date: July 4, 1991

Inventor: T. Okada, et al.

Applicant: OLYMPUS OPTICAL CO., LTD.

[Name of Document] SPECIFICATION

[Title of the Device] HIGH FREQUENCY TREATMENT TOOL FOR ENDOSCOPE

[Claims]

[Claim 1]

A high frequency treatment tool for an endoscope, comprising:

a flexible tube with an electrical insulation, which should be inserted into a channel for insertion of a treatment tool of an endoscope;

a pair of electrodes for treatment, which are electrically insulated each other, and which are pivotably attached to a jaw of said flexible tube so as to open and close;

a plurality of cables for conduction and operation, connected to each of the electrodes for performing an open and close operations of these electrodes, and extended within the flexible tune as being electrically insulated each other,

and being partly fixed each other; and

an operation unit including a connecting means for connecting an end of each of cables individually with a high frequency power source,

wherein said electrodes for treatment are provided with at least one insulated stopper, which is protruded an inside of said electrodes, and which is to prevent a jaw of the respective electrodes from contacting in a closed state of the electrodes.

[Detailed Description of the Device]

[0001]

[Industrial Field of the Device]

The present device relates to a high frequency treatment tool for an endoscope, which is adapted for endoscopically introducing it into an abdominal cavity, and for performing treatments such as a cut or a coagulation and the likes of a tissue in the abdominal cavity.

[0002]

[Description of the Related Art]

Conventionally, as disclosed in Japanese Patent Laid-Open No. 58-152914, it is known a high frequency treatment tool to be used endoscopically, in which only one of the electrodes on the treatment side is introduced into the abdominal cavity, while the other of the electrodes (a patient plate) widely contacts with a body skin of a diseased site, and then a high frequency current is concentrated onto a contact portion at where the electrode on the treatment side introduced into the abdominal cavity contacts with the diseased site, so as to perform the treatments such as a cut or a coagulation and

the likes of the tissue at such contact portion.

[0003]

Further, as disclosed in Japanese Utility Model Examined Laid-Open No. 53-34232 and U. S. Patent No. 4,005,714, it has been proposed the high frequency treatment tools adapted for performing a variety of treatments by opening and/or closing a two-poles electrode for treatment, which is insulated each other by coating a member that does not contact a diseased tissue with an insulation material, and which is provided with an elastic spreadabilty, and immersing the two-poles-electrode from a jaw of a sheath, and then griping the diseased site.

[0004]

On the other hand, the one disclosed in the Germany Patent Laid-Open DE2734847, is adapted for performing the same treatments as the ones in the aforementioned publications by moving a sheath relative to a two-poles electrode for treatment, which is contained in the sheath with an elastic spreadability provided, immersing and opening and/or closing the same, and then griping the diseased site.

[0005]

[Problems to be Solved by the Device]

However, because the one disclosed in Japanese Patent Laid-Open No. 58-152914 performs the treatments by introducing only one of the electrodes on a treatment side into a abdominal cavity, and contacting the other of the electrodes (the patient plate) with the body skin in the diseased site, there are some inconveniences in terms of an efficiency and a treatment capability, and

also it is likely to generate a thermal burn in the body skin by a contact failure of the patient plate.

[0006]

On the other hand, although the thermal burn in the body skin caused by the contact failure may be avoided for the ones disclosed in Japanese Utility Model Examined Laid-Open No. 53-34232 and U. S. Patent No. 4,005,714 since they have no patient plate to be placed on the body skin of the diseased site, there is an occasion in which the diseased site cannot be griped firmly since the two-poles electrode for treatment with the elastic spreadability provided moves back and forth from the sheath. Further, because the insulation coated part in each electrode slidably moves, the insulation coated part may be slacked, and thus it is likely to generate an operation failure.

[0007]

The one disclosed in the Germany Patent Laid-Open DE2734847 is such that the electrodes thereof can be easily bowed because the sheath is moved, and as a consequence, the diseased site cannot be griped firmly.

[0008]

The present device is invented in view of the aforementioned problems, and an object thereof is to provide a high frequency treatment tool for an endoscope, which is capable of preventing a thermal burn by a contact failure, and performing a treatment efficiently, as well as griping a diseased site firmly.

[0009]

[Means for Solving the Problems]

In order to solve the aforementioned problems, a high frequency

treatment tool for an endoscope of the present device comprises: a flexible tube with an electrical insulation, which should be inserted into a channel for insertion of an treatment tool of an endoscope; a pair of electrodes for treatment, which are electrically insulated each other, and which are pivotably attached to a jaw of said flexible tube in a freely opening and closing fashion; a plurality of cables for conduction and operation, connected to each of the electrodes for performing an open and close operations of these electrodes, and extended within the flexible tune as being electrically insulated each other, and being partly fixed each other; and an operation unit including a connecting means for connecting an end of each of cables individually with a high frequency power source, wherein said electrodes for treatment are provided with at least one insulated stopper, which is protruded an inside of said electrodes, and which is to prevent a jaw of the respective electrodes from contacting in a closed state of the electrodes.

[0010]

[Operation]

A high frequency current flows locally between both electrodes because the high frequency currents are provided to the electrodes for treatment by the connecting means for connecting the ends of the conductive operation cables, which are connected to the respective electrodes for treatment, with the high frequency power source individually. Further, because the electrodes for treatment are pivotably attached to a jaw of said flexible tube in a freely opening and closing fashion each other, as well as the operation cables are partly fixed each other, when the opening/closing operations of the electrodes for treatment are to be performed, the operational forces thereof can be equally delivered to

the respective operation cables, transmitted, as well as the tissues of diseased site can be griped firmly by performing the opening/closing operations of the electrodes for treatment assuredly. In addition, a control of a griping force is performed by the insulated stopper.

[0011]

[Description of the Embodiment(s)]

In the followings, the embodiments of the present device will be described with reference to the drawings. Figures 1 and 2 show the first embodiment of the present device. In Figure 1 (a) there is shown the main components of a high frequency treatment tool (1) for an endoscope. In Figure 1 (a), a reference numeral (2) represents a flexible metallic coil sheath to be inserted into a channel for inserting-into a treatment tool of the endoscope. The metallic coil sheath (2) forms an insertion part (6) of the tool (1), together with forceps (4), which will be described later. A tube-like jaw cover member (8) having an insulation property is fixed at a jaw of the sheath (2). A groove part (2a) for fitting is formed on a peripheral surface of the jaw of the sheath (2). A fitting part (8a) formed on a base end of the jaw cover member (8) is fitted with the groove part (2a).

[0012]

On a jaw side of the jaw cover member (8), a large diameter part (8b) having a diameter larger than that of the fitting part (8a) is formed. A slit (8c) is formed in the large diameter part (8b) of the jaw cover member (8). An insulation tube (10) is coated from the fitting part (8a) of the jaw cover member (8) through a periphery of the coil sheath (2).

[0013]

Further, at an opening end of the slit part (8c) of the jaw cover member (8), a pair of the forceps (4a, 4b) as electrodes for treatment are pivotally connected around a pivot pin (12) so that the jaw is enabling to open and close. In these forceps (4a, 4b), the grip parts (4c, 4d) for griping foreign substances and the like within a body cavity are formed on the jaw thereof, and the fitting parts (4e, 4f) to be fitted to the pivot pin (12) are formed on the base end thereof, respectively.

In the meantime, each of the forceps (4a, 4b) is arranged such that the griping parts (4c, 4d) and the fitting parts (4e, 4f) are formed by twisting portions of a plate material, for example a metallic plate.

[0014]

Further, within the slit part (8c) in the jaw cover member (8), as shown in Figure 1 (b), an electrical insulation spacing member (14) is attached around the pivot pin (12). In addition, forceps connecting grooves (14a, 14b) are formed at both ends of the spacing member (14). The fitting parts (4e, 4f) of the respective forceps (4a, 4b) are pivotally supported between the forceps connecting grooves (14a, 14b) of the spacing member (14) and an inner wall of the slit part (8c) in the jaw cover member (8), while the respective forceps (4a, 4b) are insulated from each other. In the griping parts (4c, 4d) of the forceps (4a, 4b), there are provided the insulation stoppers (20, 20), which are protruded into insides thereof, and thus they contact mutually in a closed state of the griping parts (4c, 4d) so as to prevent the jaws of the griping parts (4c, 4d) from contacting each other.

[0015]

In the sheath (2), the two operation wires (16a and 16b) are inserted in as the operation cables, and are connected to the fitting parts (4e, 4f) in the respective forceps (4a, 4b), respectively, with forming the rings as shown in Figure 1 (c). One (16a) of the operation wires is coated with an insulating tube (17), and being tied with the other (16b) of the operation wires at the jaw side by the bundling member (18).

[0016]

An insertion unit (6) is connected to an operation unit (30) shown in Figure 2 by a connecting unit (22), which is to be connected to a hand side thereof. In this case, a base end of the sheath (2) in the insertion unit (6) is connected to a sheath connecting unit (26) provided at the jaw of the connecting member (24) of the connecting unit (22).

[0017]

A third constricted slot (24a) is formed in a back peripheral unit of the sheath connecting unit (26) of the connecting member (24). Also, the operation wire (16b) not coated with an insulating tube (17) is connected with a tubular member (28) electrically and mechanically. For this tubular member (28), a portion at a jaw side thereof is installed approximate coaxially within the connecting member (24), and the base end side thereof is protruded from a base end of the connecting member (24). The operation wire (16a) coated with the insulating tube (17) extends through the tubular member (28), protrudes from the base end of the tubular member (28), and couples with the fitting unit (32b) formed at the jaw side of the first terminal (32) electrically and mechanically. A

first constricted slot (32a) is formed in a periphery at the base end side of the first terminal (32). Also, the base end side of the tubular member (28) becomes as a second terminal (29), and a second constricted slot (29a) is formed in a periphery of this second terminal (29).

[0018]

The operation unit (30) includes a main body (36), a sheath fitting unit (38) provided at a jaw of the main body (36), and a slider (40) slidably provided along an axial direction of the main body (36).

[0019]

It is configured that the sheath connecting unit (26) of the connecting member (24) enables to detachably connect to the sheath fitting unit (38). That is to say, as shown in Figure 3, the sheath fitting unit (38) includes a rotating ring (38a) and a fitting plate (38b), and an eccentric hole is formed in the rotating ring (38a). Then, the fitting plate (38b) is embedded in this hole, and by rotating the rotating ring (38a) in a fixed direction, the eccentric hole also rotates inevitably, thereby the fitting plate (38b) embedded in the eccentric hole slides in an upward direction, and it is configure that the third constricted slot (24a) of the connecting member (24) is engaged with a stoma (37) provided in the fitting plate (38b). Also, in order to disengage them, it is only necessary to rotate the rotating ring (38a) in a direction opposite to the aforementioned direction.

[0020]

The main body (36) in the operation unit (30) includes a slit at a center, and a parent finger hook unit (41) at an end. The slider (40) includes two finger hooks (42, 43), as well as two attaching units, i.e., a first attaching unit (45) and a

second attaching unit (46), which are spaced apart each other in an axial direction. The first and second fitting units (45, 46) constitute connecting means for connecting the ends of the respective operation wires (16a, 16b) to the high frequency power source, individually.

[0021]

The first and second fitting units (45, 46) includes an approximately cylindrical first container member (51a) and an approximately cylindrical second container member (51b), each of which is fixed to the slider (40) and can slide in the slit (39), respectively.

[0022]

By engaging the flange units (52) formed at both end units with the slot (40b) formed in a peripheral surface of the slider (40), the first container member (51a) and second container member (51b) are fixed to the slider (40) as well as held in the slit (39), respectively.

[0023]

A first plug (53a) and second plug (53b), each of which makes an electrical connection with the high frequency power source are extended from the flange unit (52) and formed at one ends of the first container member (51a) and of the second container member (51b), respectively. A first push rod (55a) and second push rod (55b), as well as a first spring (57a) and second spring (57b) for energizing these push rods (55a, 55b) in axial directions of the containing member (51a, 51b) are accommodated in the first container member (51a) and second container member (51b), respectively. In the first and second push rods (55a, 55b), ends thereof at the opposite side of the one which is

energized by the springs (57a, 57b) are a constricted unit (59) formed in a slender, and this constricted unit (59) protrudes outside from an opening unit (60) provided at the other ends of the first container member (51a) and second container member (51b), and this protruded end is formed in a button unit (61) with a large diameter. In a usual state, the pus rods (55a, 55b) are held in the container members (51a, 51b) by the energizing forces of the springs (57a, 57b) in a state that a level difference (step) unit (63), which forms the constricted unit (59), runs against a level difference unit (65) formed at an end of an inner peripheral surface.

Further, a through-hole (67) and a slot (69), which reaches to the through-hole (67), are formed in the first and second push rods (55a, 55b), respectively.

[0024]

When connecting the insertion unit (6) to the operation unit (30), at first, the base end side of the connecting unit (22) is passed through the slit (39) in the main body (36) of the operating unit (30). Then, the first and second pushing rods (55a, 55b) are pushed against the energizing forces of the first and second springs (57a, 57b) by pushing the button unit (61) of the first and second attaching unit (45, 46), thereby inserting a first terminal (32) and a second terminal (29) of the connecting unit (22) into the through-hole (67) of the first and second pushing rods (55a, 55b). Then, after placing the first constricted slot (32a) of the first terminal (32) and the second constricted slot (29a) of the second terminal (29) nearby the slot (69) of the first and second pushing rods (55a, 55b), respectively, the button unit 61) is detached. As a result of this, the

first and second pushing rods (55a, 55b) are pushed up by the energizing forces of the first and second springs (57a, 57b), the first constricted slot (32a) of the first terminal (32) and the second constricted slot (29a) of the second terminal (29) are fitted with the slots (69) of the first and second pushing rods (55a, 55b), and the operation wires (16a, 16b) are fixed to the slider (40).

[0025]

Further, while placing a vicinity of the sheath connecting unit (26) in the connecting member (24) in the sheath fitting unit (38) of the operation unit (30), the fitting plate (38b) slides by rotating the rotating ring (38a) of the sheath fitting unit (38), thereby engaging the fitting plate (38b) with the third constricted slot (24) of the connecting member (24). As a result, the sheath (2) is connected to the connecting unit (22) and also coupled to the operation unit (30).

[0026]

In the followings, an operation of the tool (1) will be described. At first, the tool (1) is introduced into the body cavity via the insert-into channel of the endoscope at a time of using the tool (1). After having moved the jaw of the tool (1) closer to the foreign substances under an observation with the endoscope, the tool (1) is then operated.

[0027]

A slider (40) in the operation part (30) is operated at a time of operating the tool (1). In this case, the slider (40) of the operating part (30) is pushed toward the jaw side, the operation wires (16a, 16b) are pushed forward along therewith, and the griping parts (4c, 4d) are opened up at the jaw of the forceps (4a, 4b), and then the opened forceps (4a, 4b) are lead to a tissue in the body

cavity, for example, a bleeding site.

[0028]

In this state, subsequently the operation wires (16a, 16b) are dragged toward the hand side by pulling the slider (40) in the operating part (30) toward the hand side, thereby closing the griping parts (4c, 4d) at the jaw of the forceps (4a, 4b), and the foreign substances are griped. At this moment, the jaws of the griping parts (4c, 4d) do not contact each other by an abutment of the opposite stoppers (20, 20), which are provided in the respective griping parts (4c, 4d).

[0029]

Further, electrically connecting the high frequency power source which is not illustrated, and the plugs (53a, 53b) in the accommodation member (51a, 51b) provided in the first attaching unit (45) and the second attaching unit (46) of the slider (4) in the operation unit (30), and then energizing the forceps (4a, 4b) individually by flowing a high frequency current through the respective operation wires (16a, 16b) via the first attaching unit (45) and the second attaching unit (46), the high frequency current flows between the griping parts (4c, 4d), thereby enabling to cautery-coagulate the gripped tissue.

[0030]

Therefore, the high frequency treatment tool (1) for endoscope with the aforementioned constitute, constitutes the connecting means for connecting the ends of the respective operation wires (16a, 16b) via two attaching units (45, 46) provided in the slider (40) of the operation unit (30), as well as individually supplies the high frequency currents to the forceps (4a, 4b) as the electrodes for treatment, with the connecting means, thereby enabling to enhance the local

treatment ability.

In addition, no thermal burn is generated in the body skin by a contact failure and the like, since no patient plate is used.

[0031]

Further, because the forceps (4a, 4b) are pivotably attached to the jaw cover (8), and are pivoted around the pivot pin (12) as an axial center, so as to be opened and/or closed, while the operation wires (16a, 16b) are band together by the bundling member (18), and fixed to one slider (40) firmly, it enables to deliver the force equally to the operation wires (16a, 16b), when performing the open/close operations of the forceps (4a, 4b), and thus the diseased site tissue can be gripped firmly by performing the open/close operations of the gripping units (4c, 4d) reliably.

[0032]

In the griping parts (4c, 4d) of the forceps (4a, 4b), there are provided the insulation stoppers (20, 20), which are protruded into insides thereof, and thus they contact mutually in a closed state of the griping parts (4c, 4d) so as to prevent the jaws of the griping parts (4c, 4d) from contacting each other, and thus not over-griping a diseased tissue, thereby preventing the diseased tissue from being cut mechanically.

Further, the connecting mean for individually connecting the ends of the respective operation wires (16a, 16b) to the high frequency power source is not limited to the aforementioned constituent.

[0033]

An insulation stopper (70) for preventing the jaws of the griping parts (4c,

4d) from contacting each other at a time of closing the griping parts (4c, 4d) of the forceps (4a, 4b), may be provided only on one (4a) of the griping parts, as shown in Figure 5, and is configured to contact with an inner surface of the other one (4b) of the griping parts in a closing state of the griping parts (4c, 4d). Alternatively, as shown in Figure 6, the insulation stoppers (75, 75) may be provided on the inner surfaces of the respective griping parts (4c, 4d), respectively, and is configured to contact with the opposite inner surfaces of the griping parts (4c, 4d) without abutting each other.

[0034]

[Advantage(s) of the Device]

As described above, since the present device supplies a high frequency current to the electrode for treatment and flows the high frequency current locally between two electrodes by the connecting means for connecting the ends of the conductive operation cables connected to each of the electrodes for treatment individually to a high frequency power supply, it can enhance the treatment ability thereof.

Further, no thermal burn is generated in the body skin by a contact failure and the like, since no patient plate is used.

[0035]

In addition, because the electrodes for treatment are pivotably attached to the jaw of flexible tube each other in a free opening/closing manner, while the respective operation wires are collected partly and fixed, it enables to deliver the force equally to the respective operation wires, when performing the open/close operations of the electrodes for treatment, and thus the diseased site tissue can

be gripped firmly by performing the open/close operations of the electrodes for treatment.

On the other hand, because the electrodes for treatment include the insulating stoppers which are protruded to an inside of the electrodes and prevent the jaws of the respective electrodes from contacting in the closed state of the electrodes, it does not cut the diseased site tissue mechanically by gripping it too strongly.

[Brief Description of the Drawings]

[Figure 1] (a) is a side cross sectional view at the insertion unit and connection unit in the high frequency treatment tool for endoscope, showing a first embodiment of the present device; (b) is a longitude cross sectional view along the line A-A in (a), and (c) is a cross sectional view along the line B-B in (b);

[Figure 2] A schematic configuration view of the operation unit in the high frequency treatment tool for endoscope showing a first embodiment of the present device;

[Figure 3] A detailed cross sectional view in which the connection unit shown in Figure 1 is connected to the operation unit shown in Figure 2;

[Figure 4] (a) is a cross sectional view along the line C-C in Figure 3, and (b) is a cross sectional view along the line D-D in Figure 3;

[Figure 5] A cross sectional view showing an alternative of the insulating stopper of the high frequency treatment tool for endoscope shown in Figure 1; and

[Figure 6] A cross sectional view showing an alternative of the insulating stopper of the high frequency treatment tool for endoscope shown in Figure 1.

[Reference Numerals]

1...HIGH FREQUENCY TREATMENT TOOL FOR ENDOSCOPE

2...SHEATH

4...FORCEPTS

12...PIVOT PIN

16...OPERATION WIRE

18...BUNDLING MEMBER

20, 70, 75...INSULATING STOPPERS

29, 32...SECOND TERMINALS

30...OPERATION UNIT

45, 46...ATTACHING UNITS

A partial translation of Japanese Utility Model Unexamined Publication No.5-5106

[0011]

[Embodiments]

In the followings, the embodiments of the present device will be described with reference to the drawings. Figures 1 and 2 show the first embodiment of the present device. In Figure 1 (a) there is shown the main components of a radio frequency treatment instrument (1) for use in an endscope. In Figure 1 (a), a reference numeral (2) represents a flexible metallic coil sheath to be inserted into a channel for use in inserting-into a treatment instrument of the endscope. The metallic coil sheath (2) forms an insertion part (6) of the instrument (1), together with forceps (4), which will be described later. A tube-like tip cover member (8) having an insulation property is fixed at a tip of the sheath (2). A groove part (2a) for use in fitting is formed on a peripheral surface of the tip part of the sheath (2). A fitting part (8a) formed on a base end of the tip cover member (8) is fitted with the groove part (2a).

[0012]

On a tip part side of the tip cover member (8), a large diameter part (8b) having a diameter larger than that of the fitting part (8a) is formed. A slit (8c) is formed in the large diameter part (8b) of the tip cover member (8). An insulation tube (10) is coated from the fitting part (8a) of the tip cover member (8) through a periphery of the coil sheath (2).

[0013]

Further, at an opening end of the slit part (8c) of the tip cover member (8), a pair of the forceps (4a, 4b) as electrodes for use in treatment are pivotally connected around a pivot pin (12) so that the tip is enabling to open and close. In these forceps (4a, 4b), the grasp parts (4c, 4d) for grasping foreign substances and the like within a body cavity are formed on the tip part thereof, and the fitting parts (4e, 4f) to be fitted to the pivot pin (12) are formed on the base end thereof, respectively.

In the meantime, each of the forceps (4a, 4b) is arranged such that the grasping parts (4c, 4d) and the fitting parts (4e, 4f) are formed by twisting portions of a plate material, for example a metallic plate.

[0014]

Further, within the slit part (8c) in the tip cover member (8), as shown in Figure 1 (b), an electrical insulation spacing member (14) is attached around the pivot pin (12). In addition, forceps connecting grooves (14a, 14b) are formed at both ends of the spacing member (14). The fitting parts (4e, 4f) of the respective forceps (4a, 4b) are pivotally supported between the forceps connecting grooves (14a, 14b) of the spacing member (14) and an inner wall of the slit part (8c) in the tip cover member (8), while the respective forceps (4a, 4b) are insulated from each other. In the grasping parts (4c, 4d) of the forceps (4a, 4b), there are provided the insulation stoppers (20, 20), which are protruded into insides thereof, and thus they contact mutually in a closed state of the grasping parts (4c, 4d) so as to prevent the tips of the grasping parts (4c, 4d) from contacting each other.

(Not Translated)

[0026]

In the followings, an operation of the instrument (1) will be described. At first, the instrument (1) is introduced into the body cavity via the insert-into channel of the endscope at a time of using the instrument (1). After having moved the tip part of the instrument (1) closer to the foreign substances under an observation with the endscope, the instrument (1) is then operated.

[0027]

A slider (40) in the operation part (30) is operated at a time of operating the instrument (1). In this case, the slider (40) of the operating part (30) is pushed toward the tip part side, the operation wires (16a, 16b) are pushed forward along therewith, and the grasping parts (4c, 4d) are opened up at the tip of the forceps (4a, 4b), and then the opened forceps (4a, 4b) are lead to a tissue in the body cavity, for example, a bleeding site.

[0028]

In this state, subsequently the operation wires (16a, 16b) are dragged toward the hand side by pulling the slider (40) in the operating part (30) toward the hand side, thereby closing the grasping parts (4c, 4d) at the tip of the forceps (4a, 4b), and the foreign substances are grasped. At this moment, the tips of the grasping parts (4c, 4d) do not contact each other by an abutment of the opposite stoppers (20, 20), which are provided in the respective grasping parts (4c, 4d).

(Not Translated)

[0032]

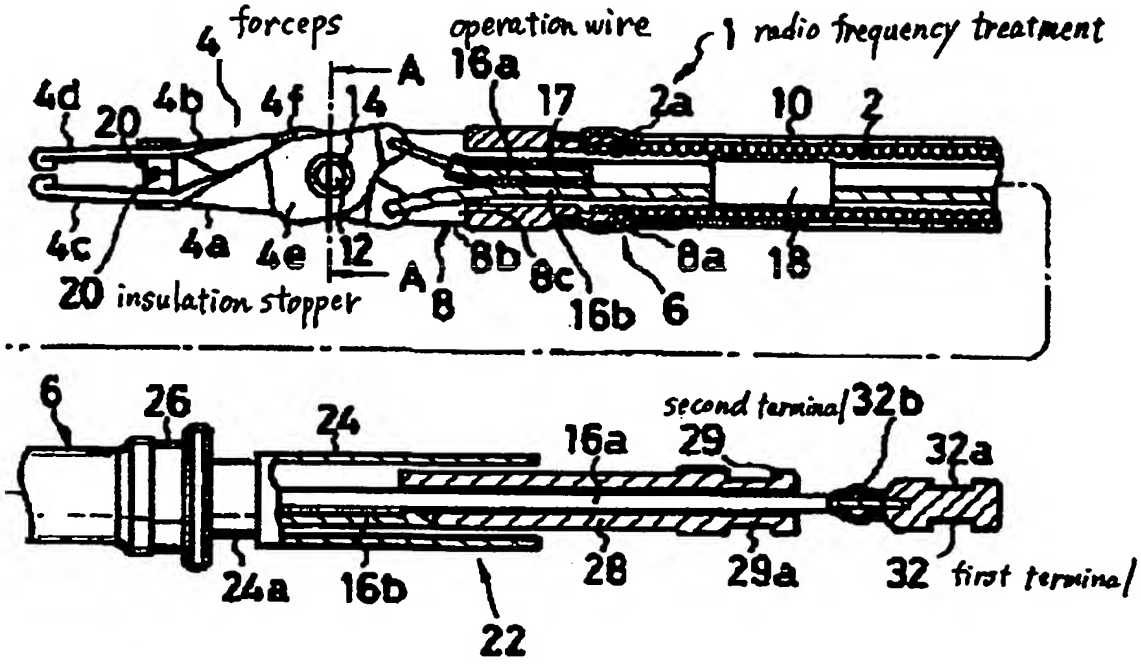
In the grasping parts (4c, 4d) of the forceps (4a, 4b), there are provided the insulation stoppers (20, 20), which are protruded into insides thereof, and thus they contact mutually in a closed state of the grasping parts (4c, 4d) so as to prevent the tips of the grasping parts (4c, 4d) from contacting each other, and thus not over-grasping a diseased tissue, thereby preventing the diseased tissue from being cut mechanically.

(Not Translated)

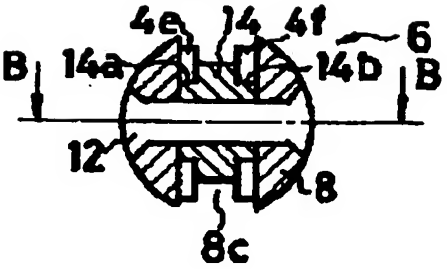
[0033]

An insulation stopper (70) for preventing the tips of the grasping parts (4c, 4d) from contacting each other at a time of closing the grasping parts (4c, 4d) of the forceps (4a, 4b), may be provided only on one (4c) of the grasping parts, as shown in Figure 5, and is configured to contact with an inner surface of the other one (4d) of the grasping parts in a closing state of the grasping parts (4c, 4d). Alternatively, as shown in Figure 6, the insulation stoppers (75, 75) may be provided on the inner surfaces of the respective grasping parts (4c, 4d), respectively, and is configured to contact with the opposite inner surfaces of the grasping parts (4c, 4d) without abutting each other.

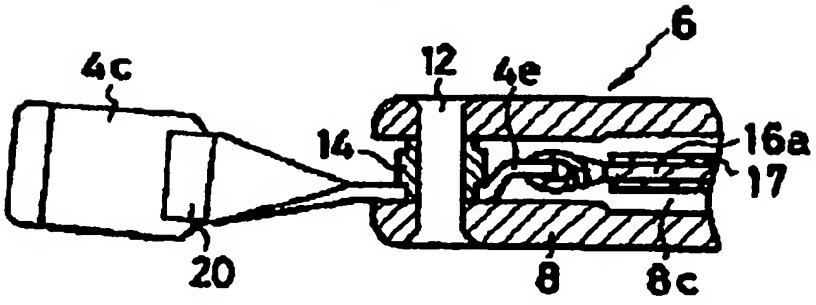
FIG.1


forceps
operation wire
radio frequency treatment
4
A
16a
1
4d
20
4b
4f
14
17
2a
10
2
4c
4a
4e
12
A
8b
8c
8a
18
20 insulation stopper
8
16b
6
6
26
24
second terminal
32b
16a
29
32a
24a
16b
28
29a
32
first terminal
22

(a)


4e
14
4f
6
B
14a
14b
B
12
8
8c

(b)


6
4c
12
4e
14
16a
17
20
8
8c

(c)

FIG.2

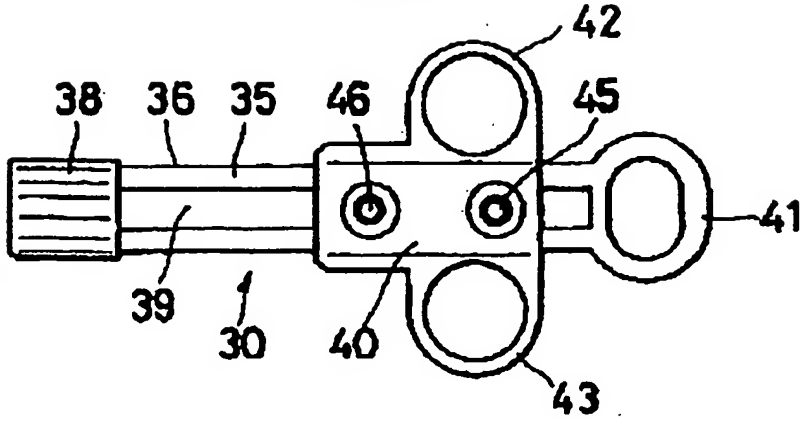


FIG.3

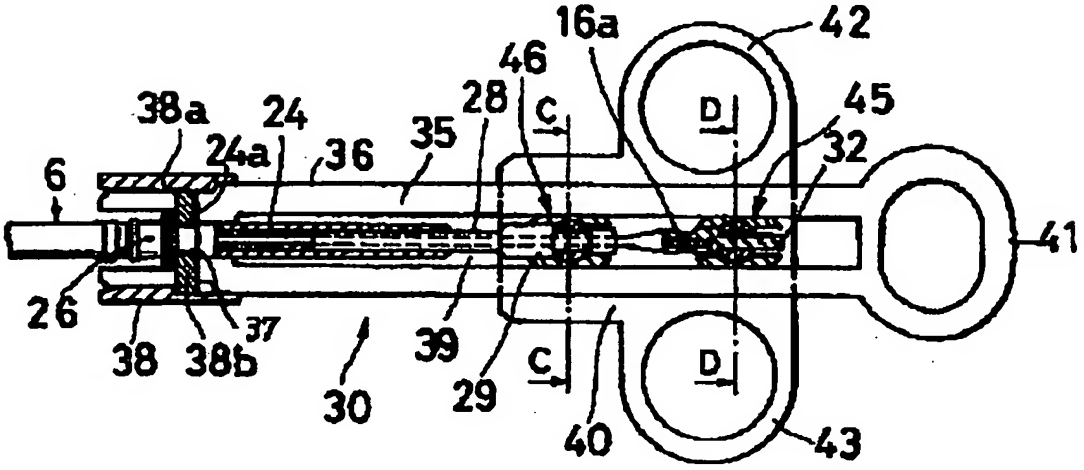
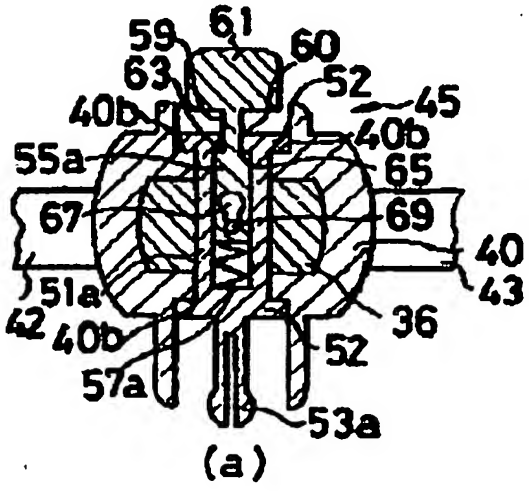


FIG.4



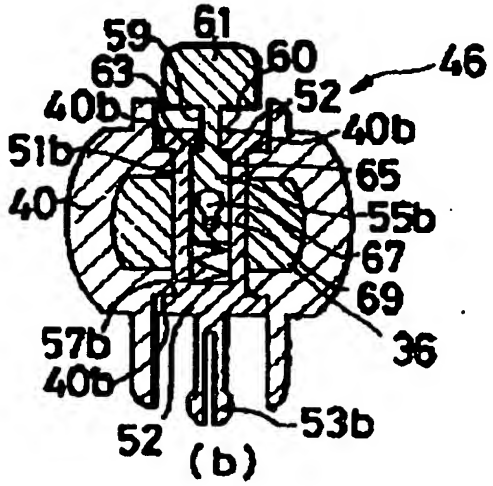


FIG.5

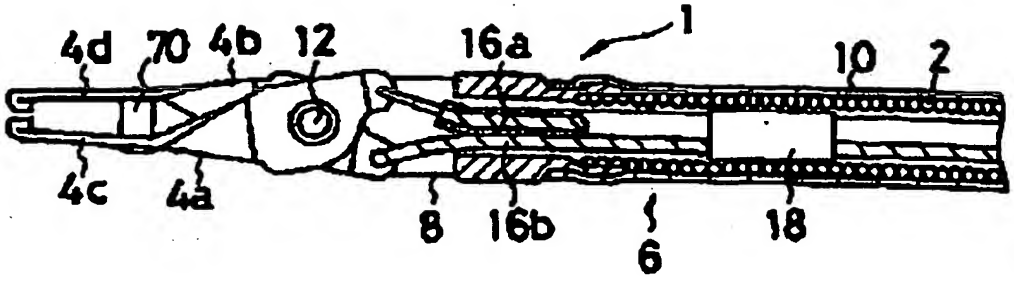
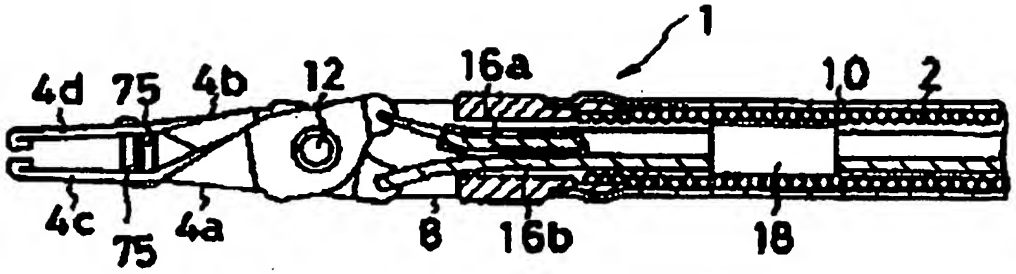

4d
70
4b
12
16a
1
10
2
4c
4a
8
16b
6
18

FIG.6


4d
75
4b
12
16a
1
10
2
4c
75
4a
8
16b
18